Visualizing and Contextualizing Quality of Life Data

Introduction

- Get closer to the QOL data.
- Develop a personalized visualization of the data
- Contextualize the visualization

Outline

- Data
- Statistical Analysis
- Pipeline
- Proposition for visualization

Data

- fam: 17 parameters

  RelativePain, FeelSad, LosingHope, EnjoyLife, TrappedByCondition, DepressedAboutCondition, FeelUseless, FeelOverwhelmed, LackEnergy, FeelTired, TroubleStarting, TroubleFinishing, NeedRest, TroubleRemembering, TroubleConcentrating, ThinkingSlower, TroubleLearning

  All (0-4) except RelativePain (0-10)

- visit: 7 parameters

  MotorWeakness , SensoryDisturbance, Ataxia, BladderDisturbance, BowelDisturbance, CogDisturbance, VisualLoss

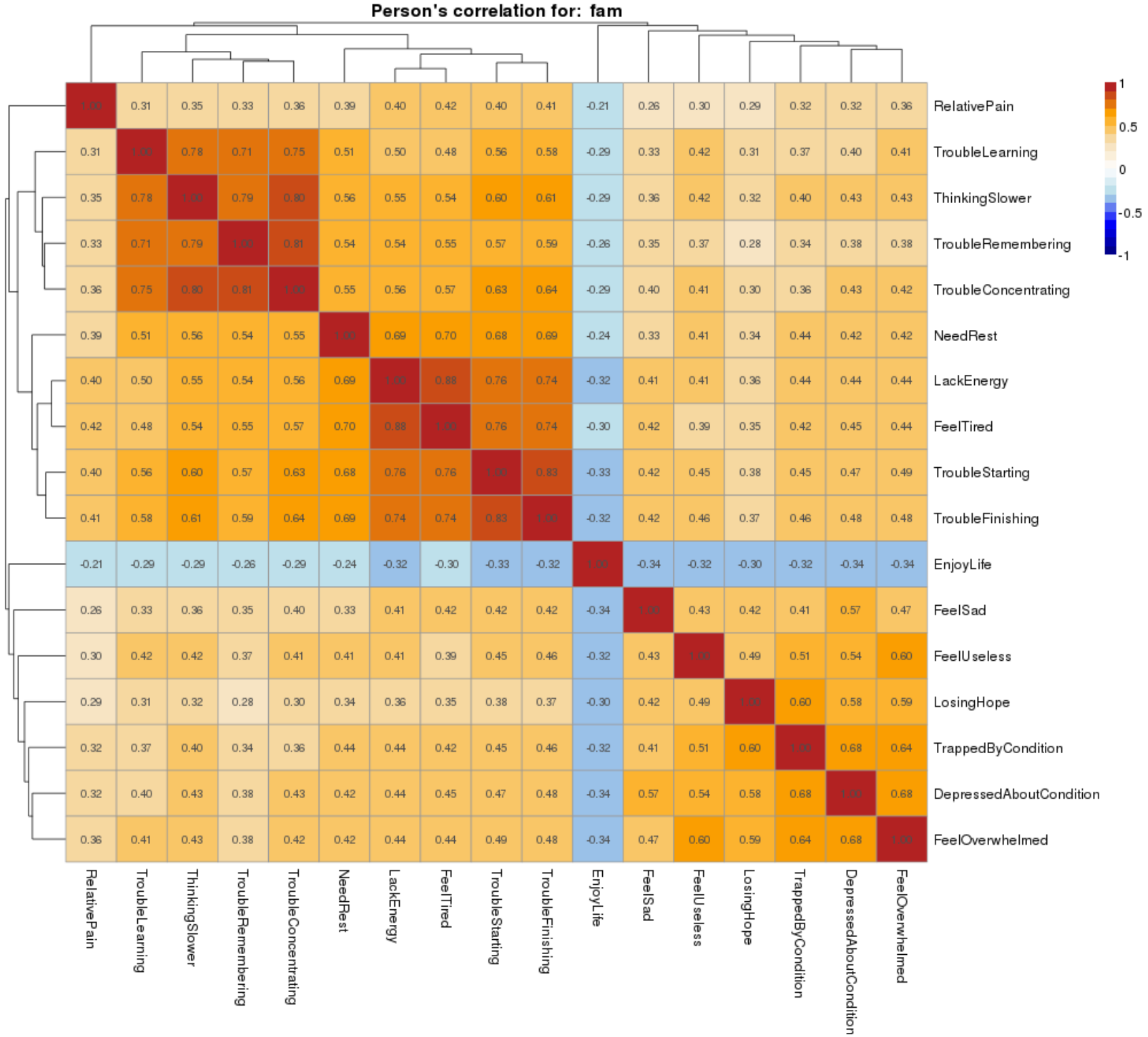
  All (0-1) except VisualLoss (0-2)

- fssc: 7 parameters

  Visual (0-6), Brainstem (0-5), Pyramidal (0-6), Cerebellar (0-5), Sensory (0-6), Bowel (0-6), Mental (0-5)

Statistical Analysis

- Goals
- Correlation
- PCA


Person's correlation for: fam
RelativePain
TroubleLearning
ThinkingSlower
TroubleRemembering
TroubleConcentrating
NeedRest
LackEnergy
FeelTired
TroubleStarting
TroubleFinishing
EnjoyLife
FeelSad
FeelUseless
LosingHope
TrappedByCondition
DepressedAboutCondition
FeelOverwhelmed
1
0.5
0
-0.5
-1

Statistical Analysis

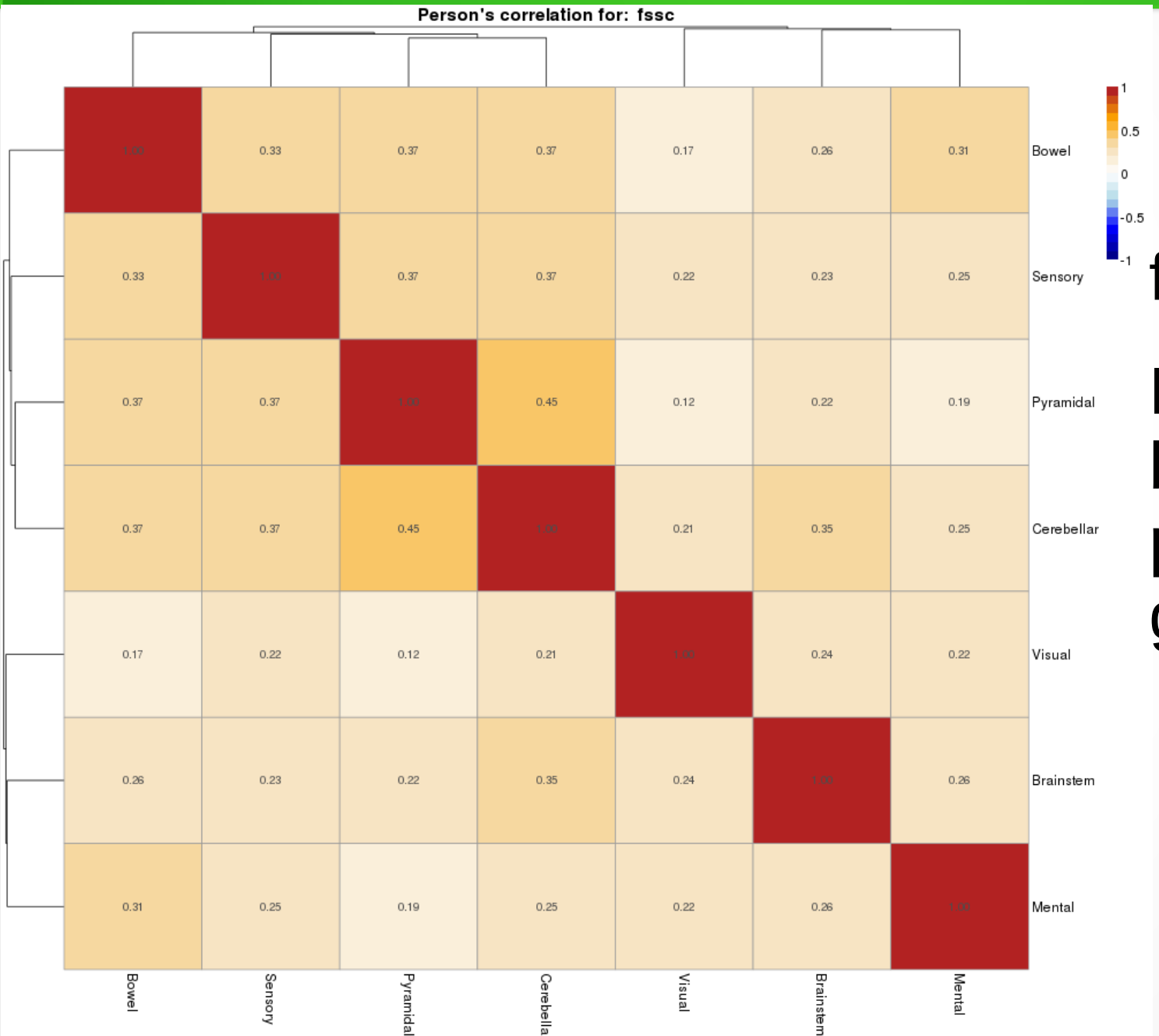
- TroubleLearning, ThinkingSlower, TroubleRemembering, TroubleConcentrating
- NeedRest, LackEnergy, FeelTired, TroubleStarting, TroubleFinishing
- FeelSad, FeelUseless, LosingHope, TrappedByCondition, DepressedAboutCondition, FeelOverwhilmed

Statistical Analysis

visit

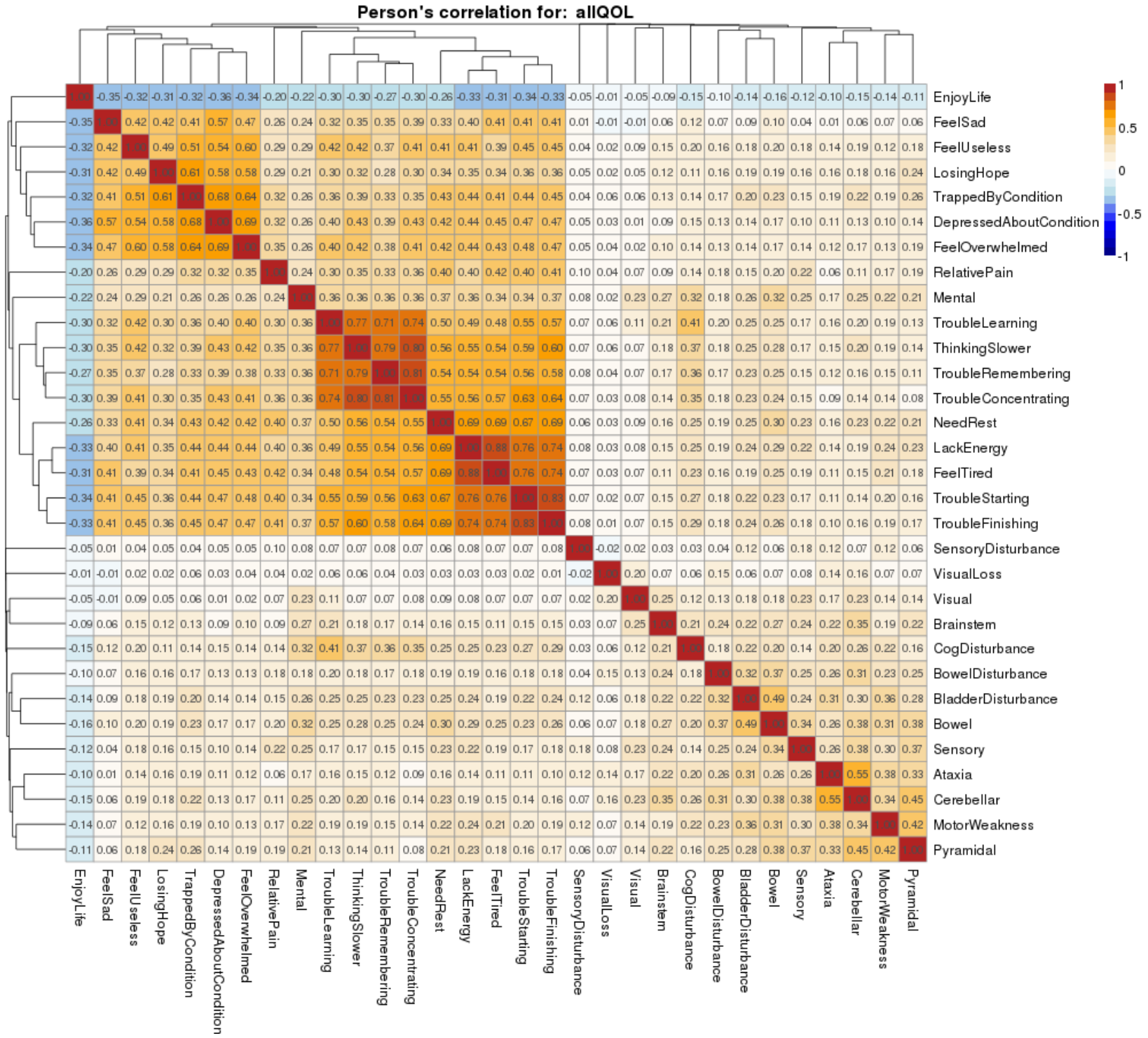
No correlation between different parameters greater than 0.4

Statistical Analysis



fssc

No correlation between different parameters greater than 0.5


Person's correlation for: allQOL
EnjoyLife
FeelSad
FeelUseless
LosingHope
TrappedByCondition
DepressedAboutCondition
FeelOverwhelmed
RelativePain
Mental
TroubleLearning
ThinkingSlower
TroubleRemembering
TroubleConcentrating
NeedRest
LackEnergy
FeelTired
TroubleStarting
TroubleFinishing
SensoryDisturbance
VisualLoss
Visual
Brainstem
CogDisturbance
BowelDisturbance
BladderDisturbance
Bowel
Sensory
Ataxia
Cerebellar
MotorWeakness
Pyramidal
1
0.5
0
-0.5
-1

Statistical Analysis

Scaling of the data

- Convert everything to 0-1 scale.
- Divide the data into 3 groups base on their original scaling:

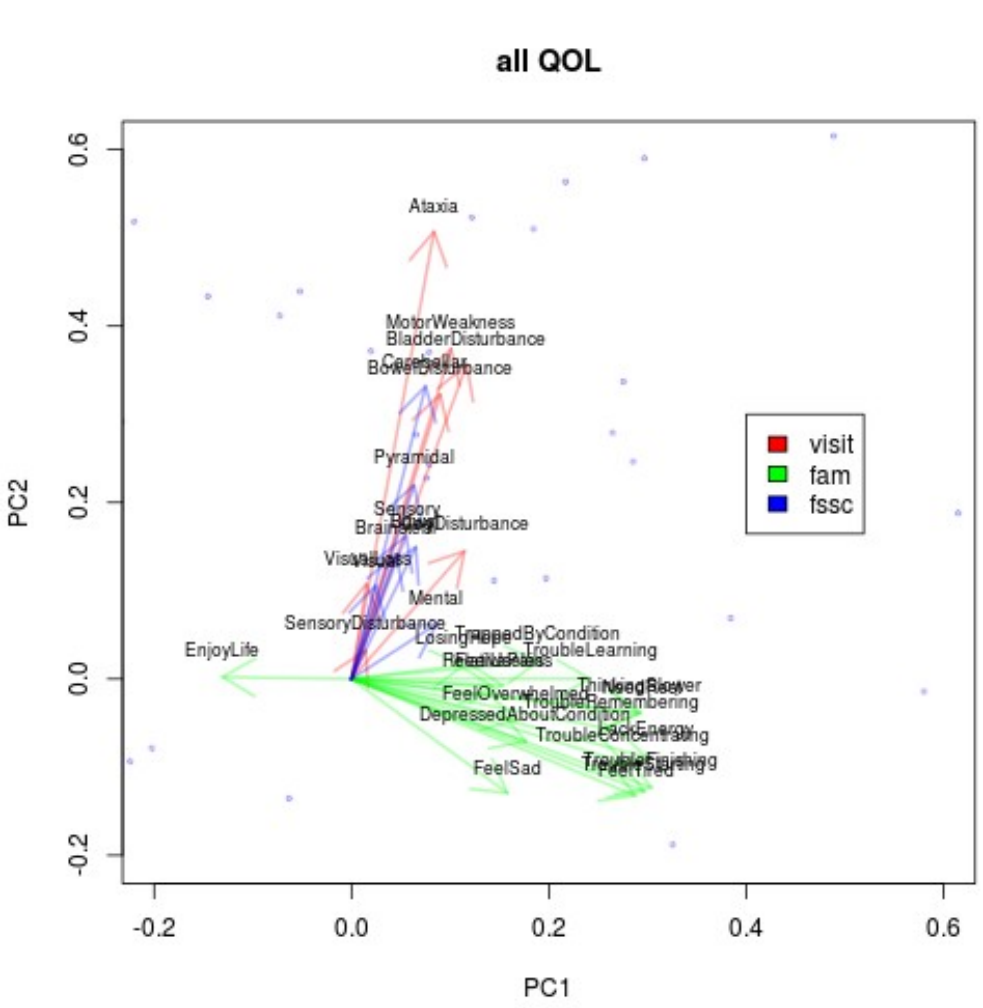
  group1: 0-1, 0-2

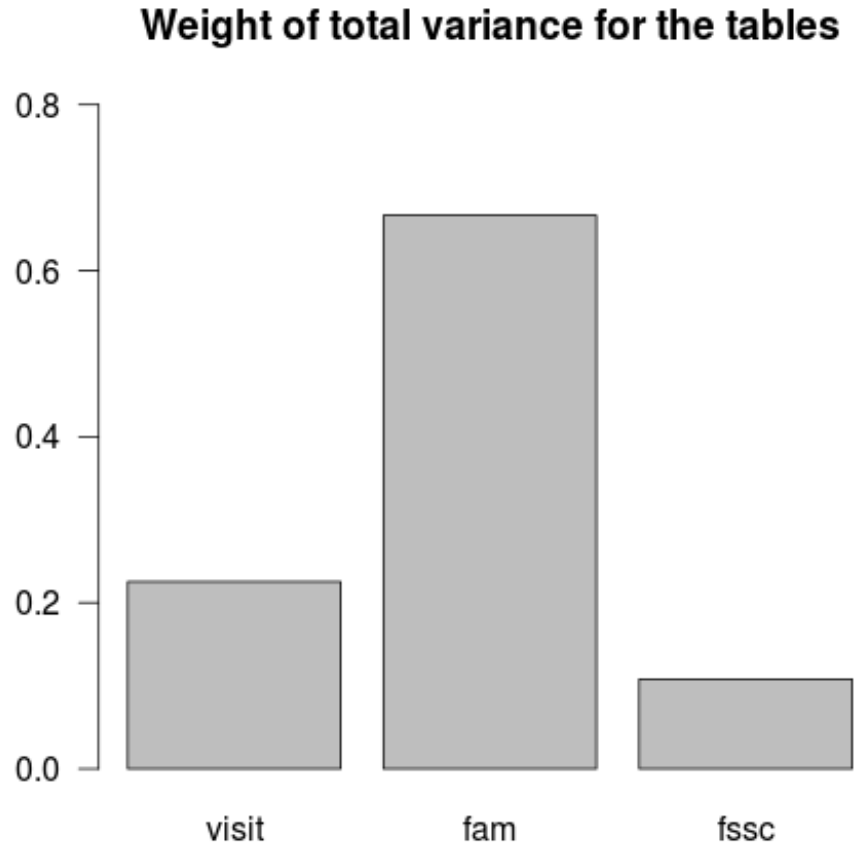
  group2: 0-4, 0-5, 0-6

  group3: 0-10
- Scale each group by:

  1 / (mean of SDs of parameters in the group)

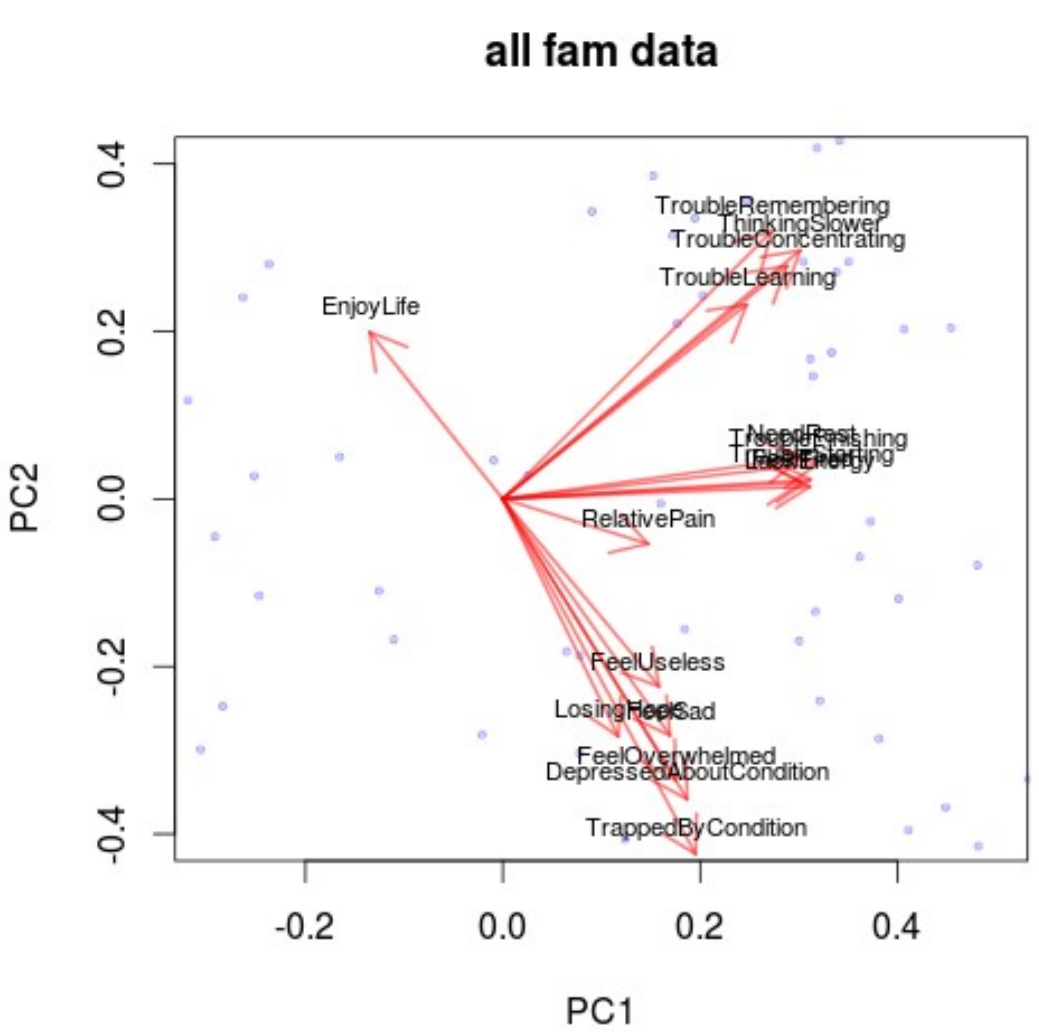
Statistical Analysis

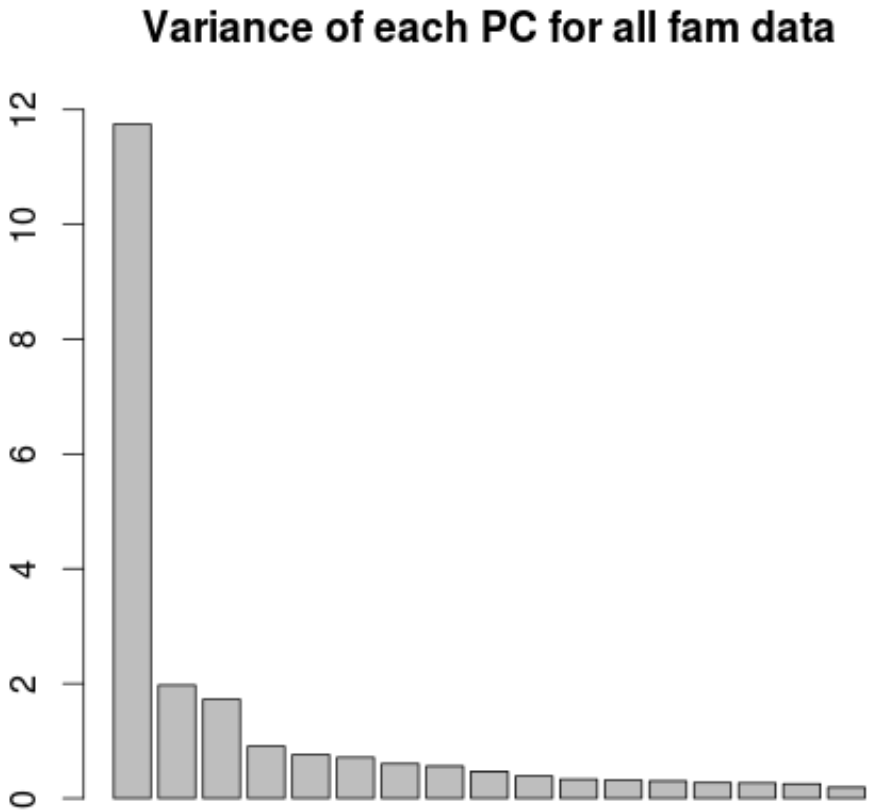




fam alone could represent QOL pretty well

Statistical Analysis





Statistical Analysis

- Group the data

Group 1: TroubleLearning, ThinkingSlower, TroubleRemembering, TroubleConcentrating

Group 2: NeedRest, LackEnergy, FeelTired, TroubleStarting, TroubleFinishing

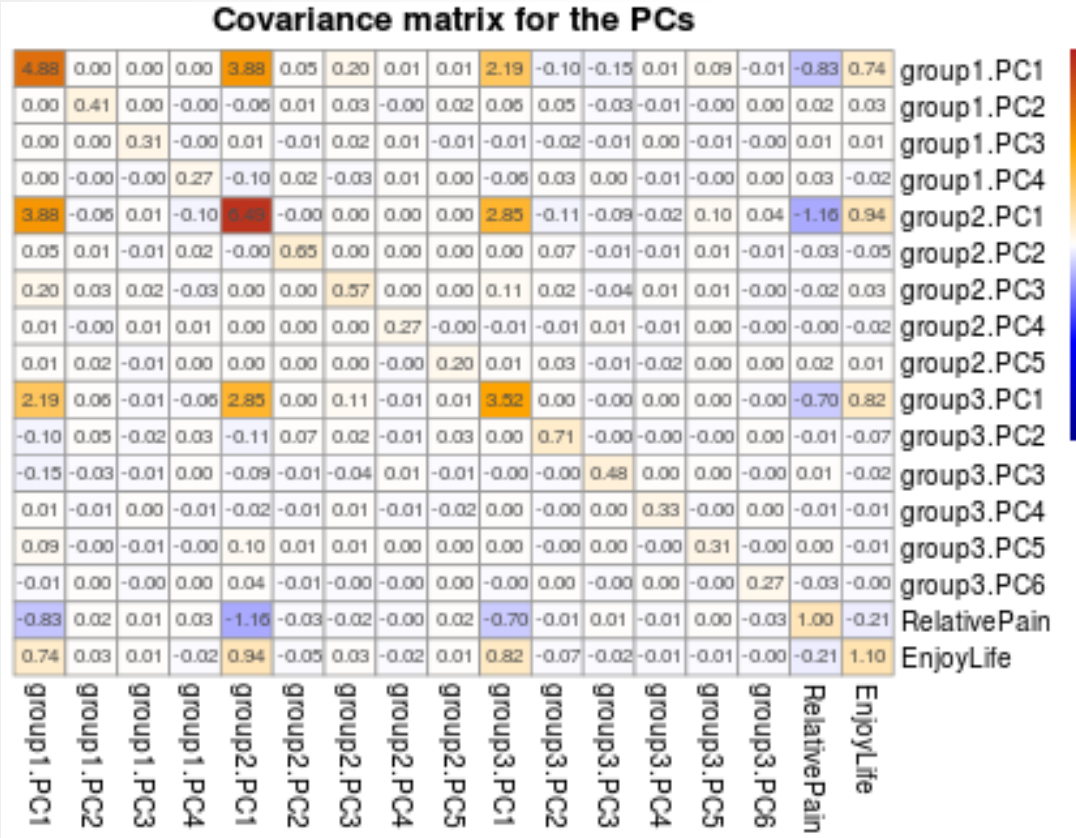
Group 3: FeelSad, FeelUseless, LosingHope, TrappedByCondition, DepressedAboutCondition, FeelOverwhilmed.

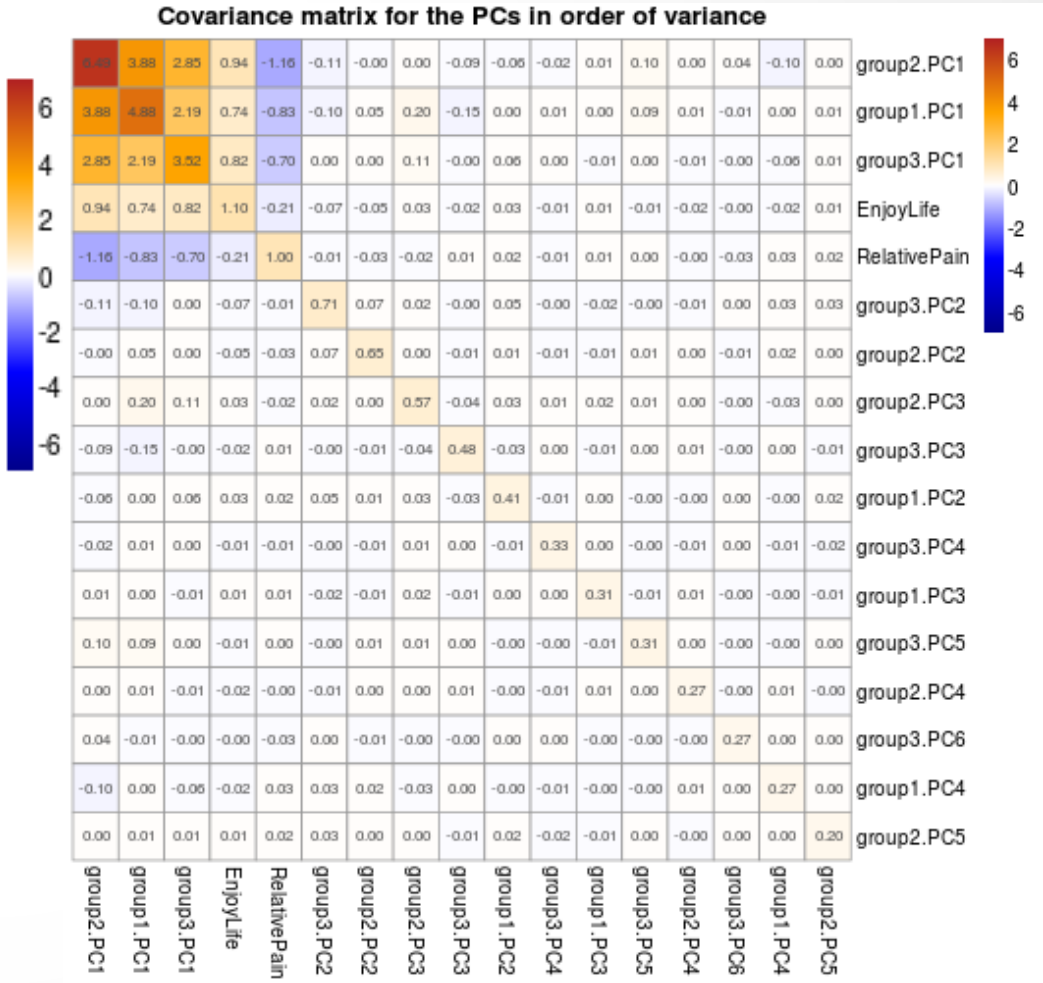
Group 4: EnjoyLife

Group 5: RelativePain

Statistical Analysis

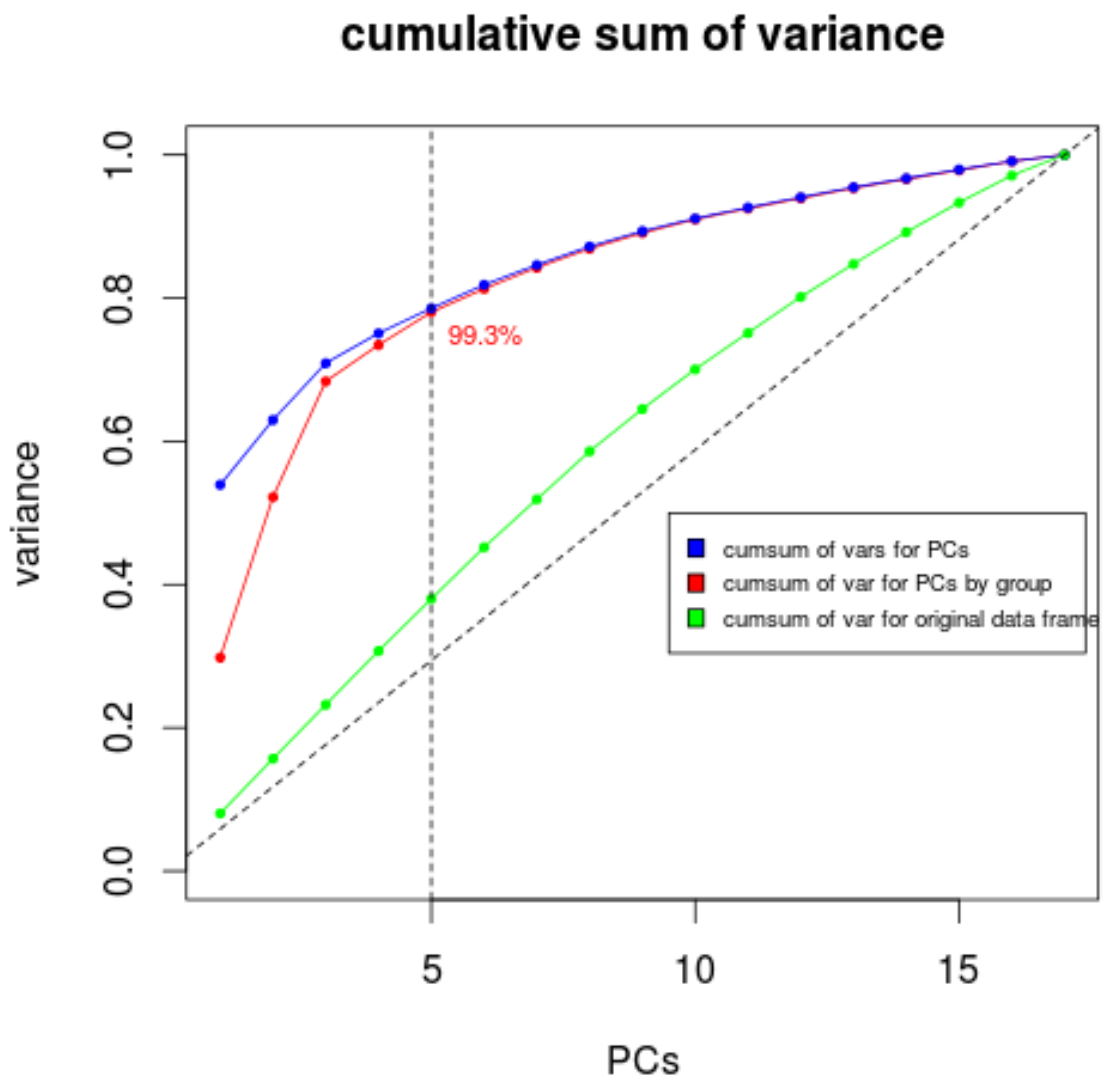
- PCs by each group





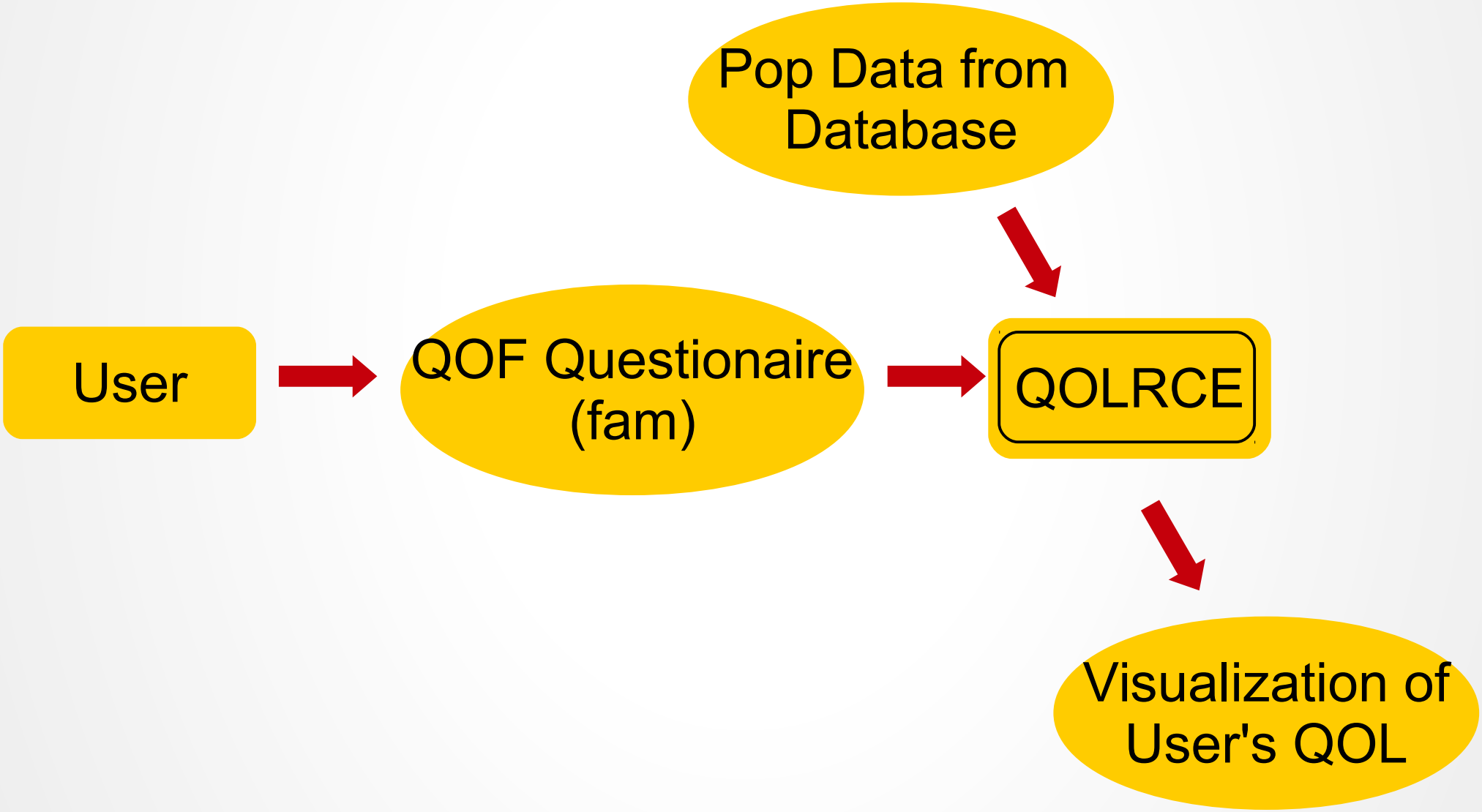
The first 5 PCs which captures the most variance are the 1st PC of each group

Statistical Analysis

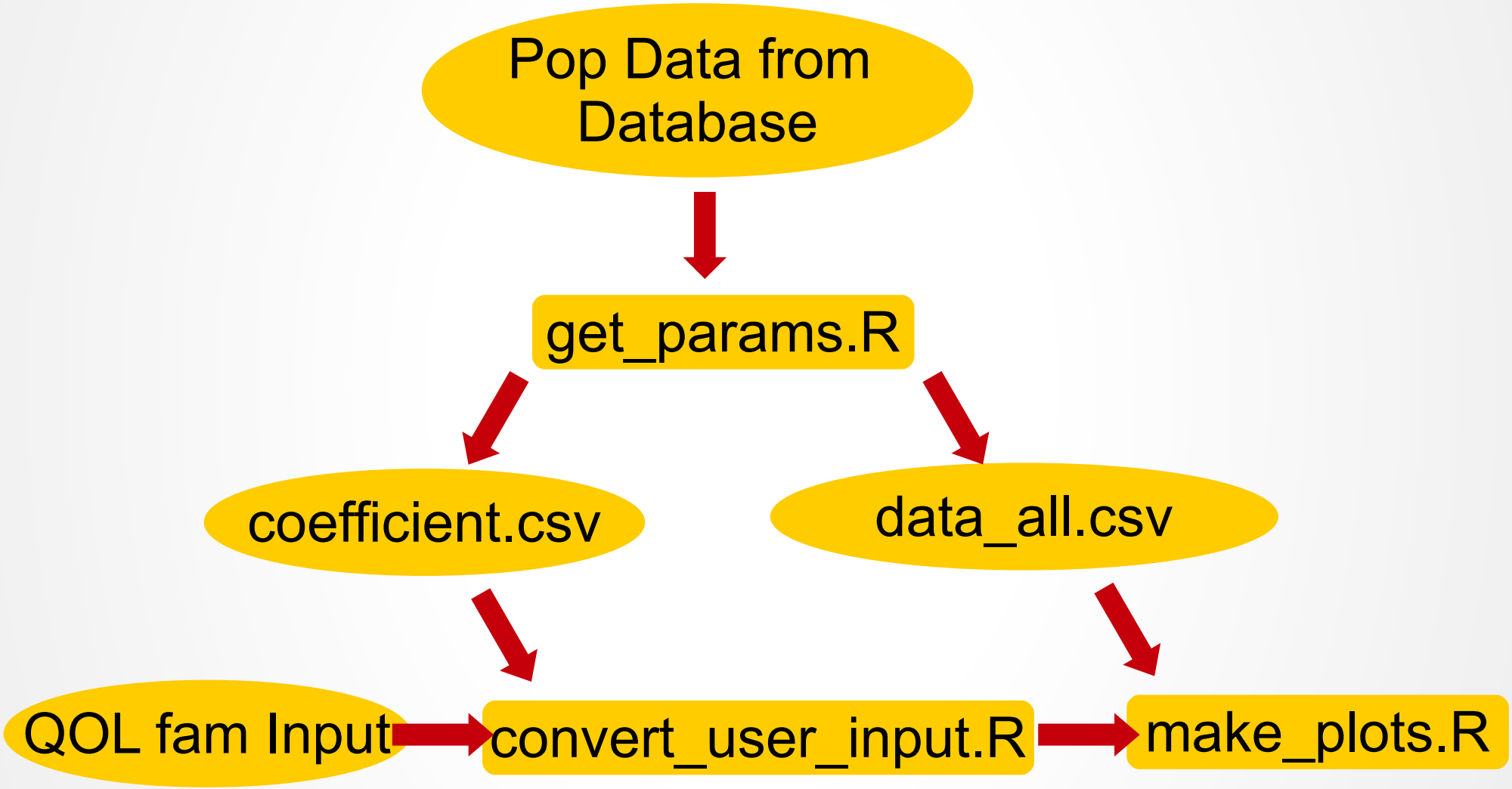


- Taking the first PC of each group captures almost the same amount of variance as the first 5 PCs of fam data.

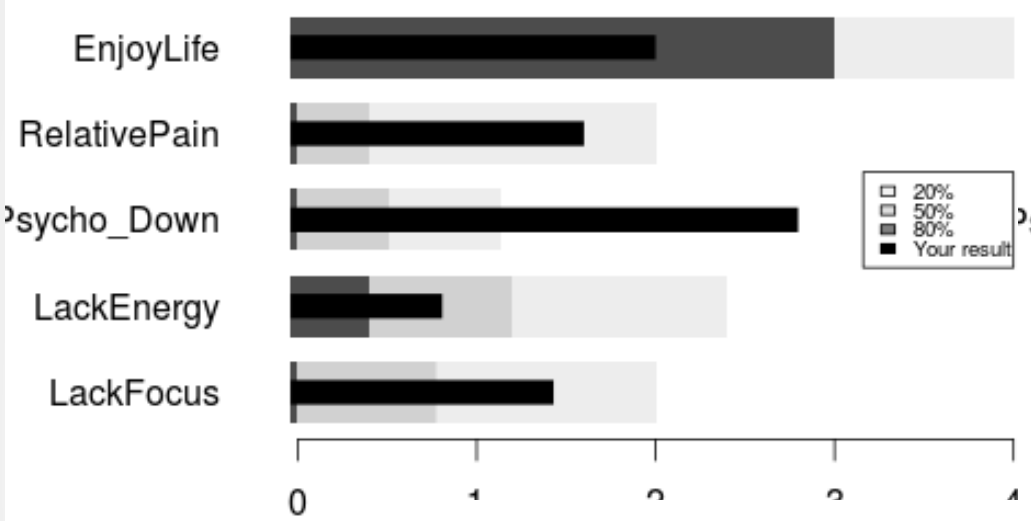
Pipeline

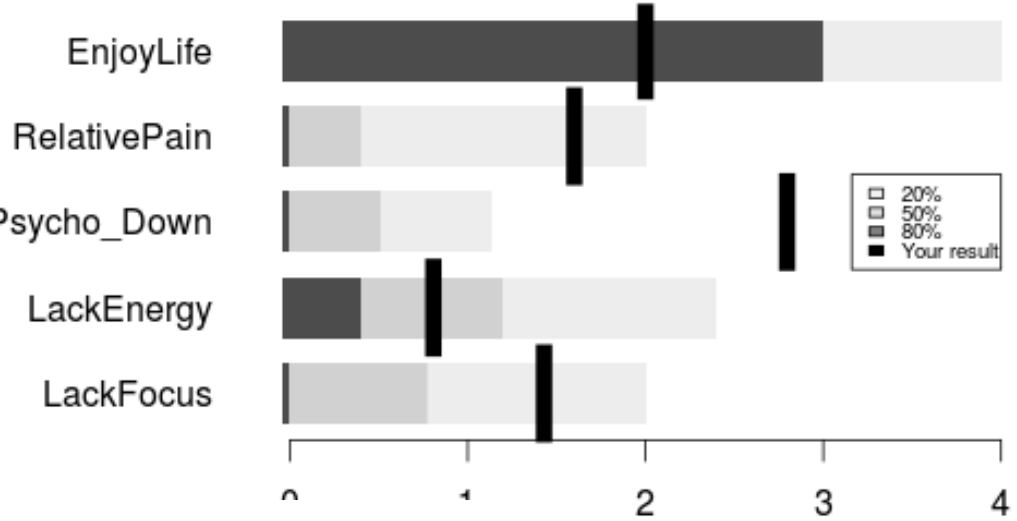

Pop Data from Database
User
QOF Questionaire (fam)
QOLRCE
Visualization of User's QOL

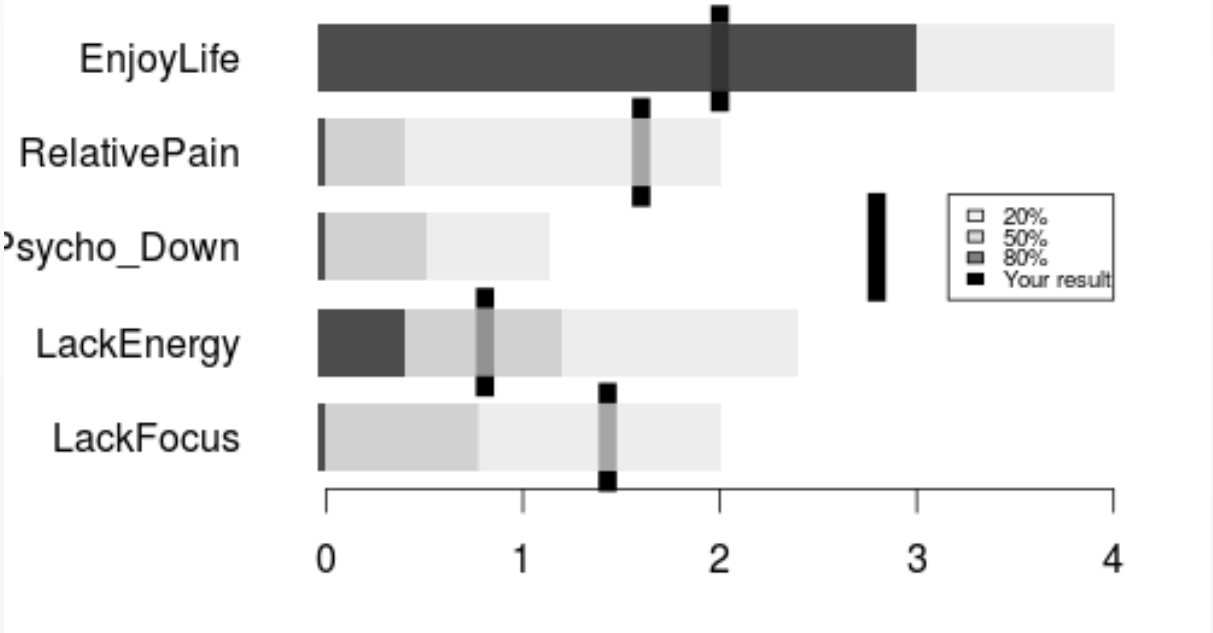
Pipline


Pop Data from Database
get_params.R
coefficient.csv
data_all.csv
QOL fam Input
convert_user_input.R
make_plots.R

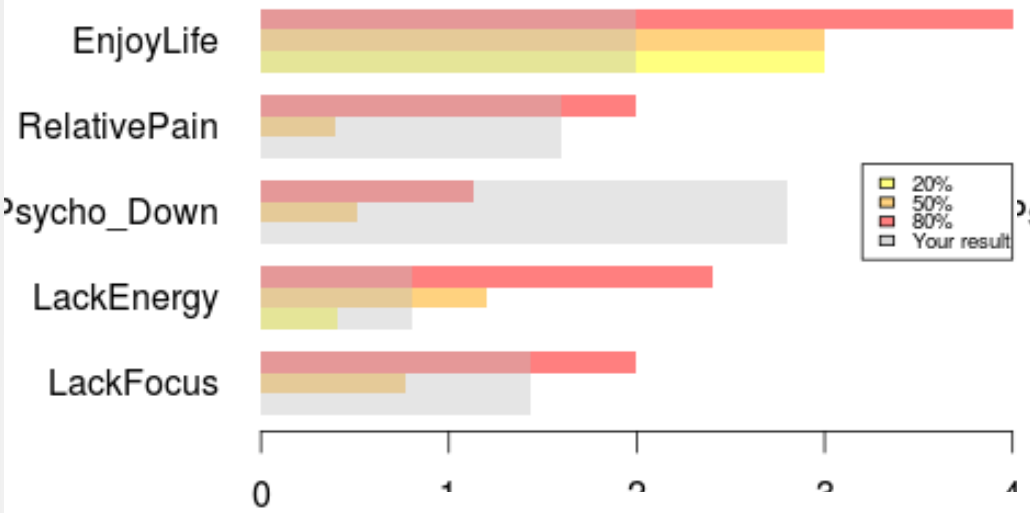
Visualization

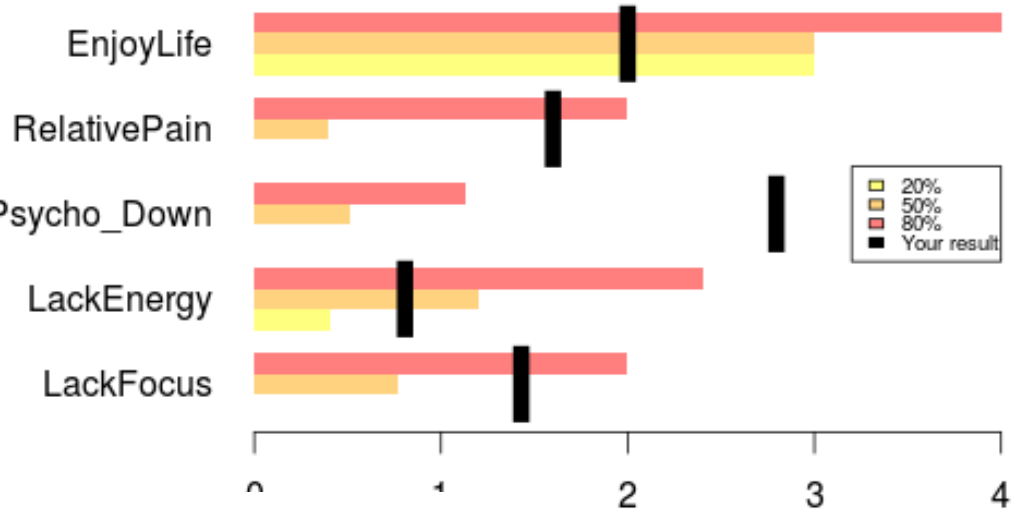


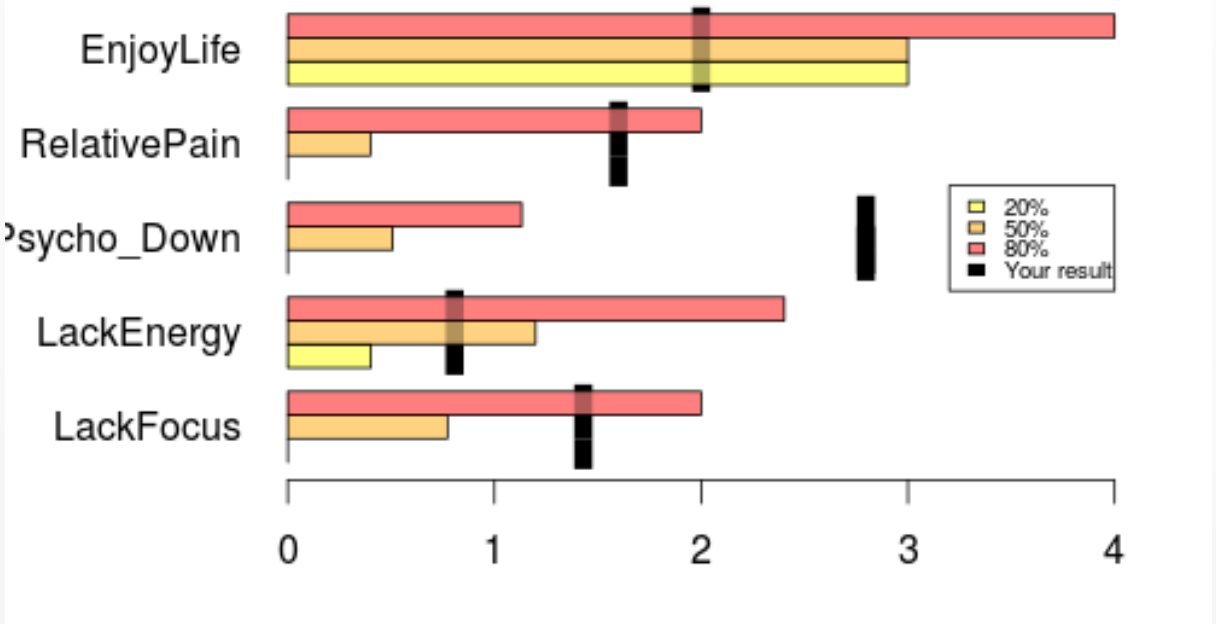


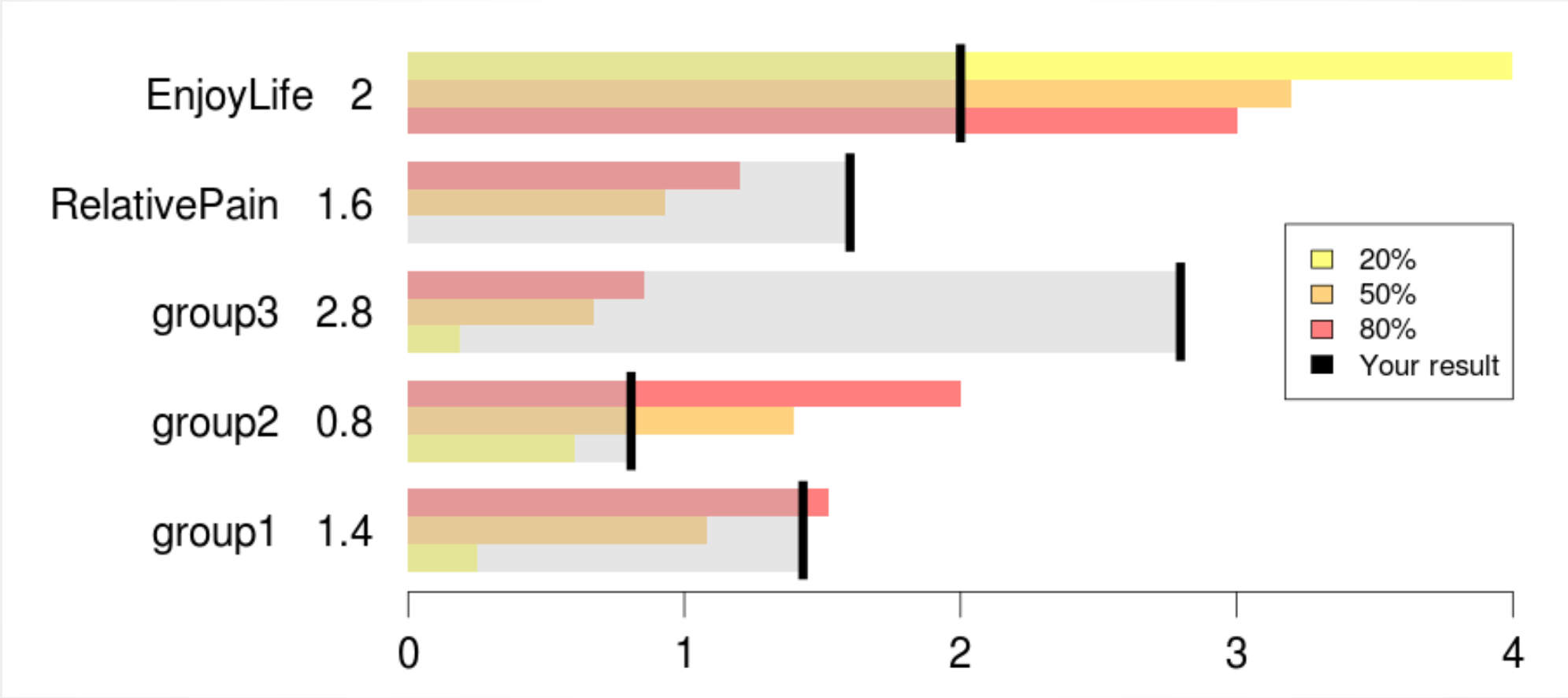


Visualization

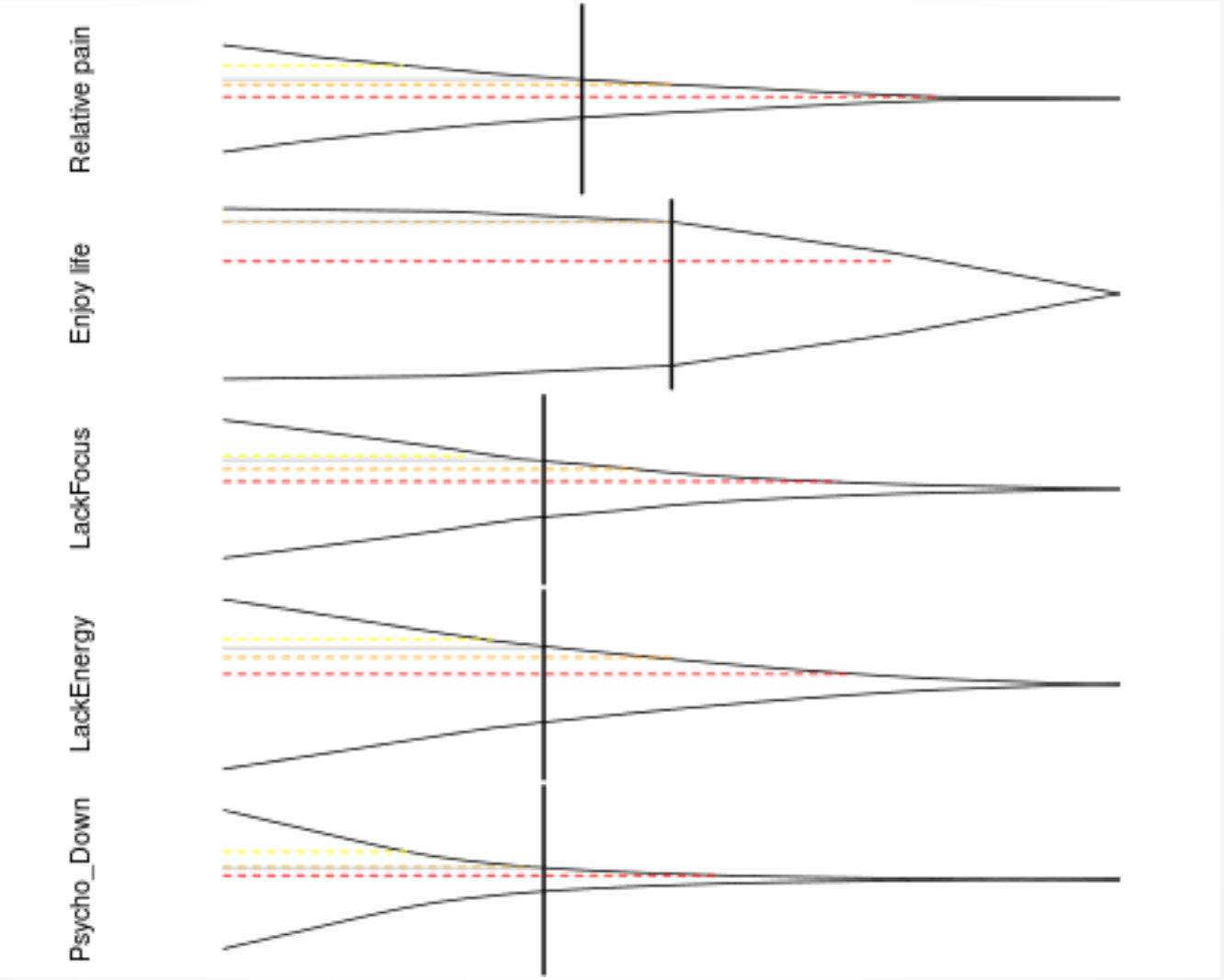







EnjoyLife 2
RelativePain 1.6
group3 2.8
group2 0.8
group1 1.4
20%
50%
80%
Your result
0
1
2
3
4

Visualization



Next Steps

- Polish the visualization
- Implement the interface

Questions?